

IN THE CLAIMS

Claims 1-20 (Canceled)

Claim 21 (Currently Amended): A catalyst ~~that can be used for use in~~ the production of hydrogen from fuel sources containing sulfur, the catalyst comprising a catalyst support comprising monoclinic zirconia; and Ir ~~on dispersed throughout~~ the catalyst support.

Claim 22 (Original): The catalyst according to Claim 21, wherein the catalyst support has a surface area of 6 m²/g or more.

Claim 23 (Original): The catalyst according to Claim 21, wherein the catalyst support has a surface area of 12 m²/g or more.

Claim 24 (Original): The catalyst according to Claim 21, wherein the catalyst support comprises 95 vol% or more of the monoclinic zirconia.

Claim 25 (Original): The catalyst according to Claim 21, wherein the catalyst support comprises 98 vol% or more of the monoclinic zirconia.

Claim 26 (Original): The catalyst according to Claim 21, wherein the Ir is uniformly dispersed on the catalyst support.

Claim 27 (Original): The catalyst according to Claim 21, wherein the catalyst support comprises an inner region and outer region surrounding the inner region; and

the outer region comprises more Ir than the inner region.

Claim 28 (Currently Amended): The catalyst according to Claim 21, wherein the catalyst comprises 0.01 to 6 wt% of the Ir.

Claim 29 (Currently Amended): The catalyst according to Claim 21, wherein the catalyst comprises 0.1 to 4 wt% of the Ir.

Claim 30 (Original): The catalyst according to Claim 21, wherein the catalyst further comprises on the catalyst support another metal that exhibits catalytic activity.

Claim 31 (Original): The catalyst according to Claim 30, wherein the other metal comprises at least one element selected from the group consisting of Ni, Co and Ru.

Claim 32 (Withdrawn-Currently Amended): A method of using a catalyst to generate generate H₂, the method comprising providing a ~~catalyst comprising a catalyst support, and at least one of Ir, Pt and Pd on the catalyst support~~ the catalyst of Claim 21; passing over the catalyst an active feedstream comprising a gaseous hydrocarbon and gaseous H₂O; and reacting the gaseous hydrocarbon and the gaseous H₂O using the catalyst to produce the H₂, wherein the active feedstream comprises 1 ppm by mass or more of S; and the catalyst support comprises at least one selected from the group consisting of calcium hexaaluminate, barium hexaaluminate, strontium hexaaluminate, monoclinic zirconia, and mixtures thereof.

Claim 33 (Withdrawn): The method according to Claim 32, wherein the active feedstream comprises 10 ppm by mass or more of S.

Claim 34 (Withdrawn): The method according to Claim 32, wherein the active feedstream comprises 100 ppm by mass or more of S.

Claim 35 (Canceled)

Claim 36 (Withdrawn): The method according to Claim 32, wherein the gaseous hydrocarbon comprises at least one selected from the group consisting of methane, ethane, propane and butane.

Claim 37 (Withdrawn): The method according to Claim 32, wherein the active feedstream further comprises 100 ppm by mass or more of O₂.

Claim 38 (Withdrawn) The method according to Claim 37, wherein the active feedstream comprises 10 ppm by mass or more of S.

Claim 39 (Withdrawn): The method according to Claim 37, wherein the active feedstream comprises 100 ppm by mass or more of S.

Claim 40 (Canceled)

Claim 41 (Withdrawn): The method according to Claim 37, wherein the gaseous hydrocarbon comprises at least one selected from the group consisting of methane, ethane, propane and butane.

Claim 42 (Withdrawn): The method according to Claim 32, further comprising passing over the catalyst an inactive feedstream comprising at least one of air and gaseous H₂O, wherein the inactive feedstream comprises less than 100 ppm by mass of the gaseous hydrocarbon.

Claim 43 (Withdrawn): The method according to Claim 42, wherein the inactive feedstream comprises 100 ppm by mass or more of O₂.

Claim 44 (Withdrawn): The method according to Claim 42, wherein the inactive feedstream comprises 1 vol% or more of O₂.

Claim 45 (Canceled)

Claim 46 (Withdrawn): The method according to Claim 42, wherein each of the active feedstream and the inactive feedstream is passed over the catalyst more than once.

Claim 47 (New): The method according to Claim 32, wherein the active feedstream comprises 1 ppm by mass or more of S.

Claim 48 (New): A method of making a catalyst, the method comprising dispersing Ir throughout a catalyst support comprising monoclinic zirconia; and producing the catalyst of Claim 21.

Claim 49 (New): The catalyst according to Claim 21, wherein the Ir is dispersed homogeneously throughout the catalyst support.